

**REMARKS/ARGUMENTS*****Status of Claims***

Claims 1, 4, 5, 7, 23, 29, 31 and 37-40 are currently amended.

Claims 3, 6, 8-22, 24-26, 33-36, and 41-43 are canceled.

Thus, claims 1-2, 4-5, 7, 23, 27-32, and 37-40 are currently pending in this application.

Applicants hereby request further examination and reconsideration of the presently claimed application.

***Claim Rejections – 35 U.S.C. § 103***

Claims 1-9, 23, 27-34, and 36-43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Bolskar*, et al., U.S. Patent Publication No. 2003/0220518 A1 (hereinafter “*Bolskar*”) in view of *Yan*, et al., U.S. Patent No. 5,830,539 (hereinafter “*Yan*”) and further in view of *Kelley*, et al., U.S. Patent No. 6,958,216 B2 (hereinafter “*Kelley*”). Claims 1-7, 9-10, 23, 27-40, 42, and 43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Bolskar* and *Yan* in view of *Lei*, et al., U.S. Patent No. 6,777,445 B2 (hereinafter “*Lei*”). Claims 2, 4-7, 27, and 29 depend from independent claim 1, claims 28, 31, and 32 depend from independent claim 23, and claims 38 and 39 depend from independent claim 37. Thus, the pending claims stand or fall on the, the application of the combination of *Bolskar*, *Yan*, and *Lei*, alternatively, the application of the combination of *Bolskar*, *Yan*, and *Kelly*, to independent claims 1, 23, and 37. As noted by the United States Supreme Court in *Graham v. John Deere Co. of Kansas City*, an obviousness determination begins with a finding that **“the prior art as a whole in one form or another contains all” of the elements of the claimed invention.** See *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 22 (U.S. 1966). The Applicants respectfully submit that the neither the combination of *Bolskar*, *Yan*, and *Lei*, nor the combination of *Bolskar*, *Yan*, and *Kelly* contains all

of the elements of the pending independent claims.

Specifically, Applicants submit that the combinations of prior art cited by the Office Action do not contain the limitation of at least two vancomycin molecules coupled to the fullerene molecule. Applicants have amended claim 1 to include limitations previously recited in claims 3 and 9. Amended claim 1 recites:

1. A fullerene-antibiotic conjugate comprising:  
at least one bone-targeting moiety coupled to a fullerene molecule;  
at least one linking molecule comprising a serinol; and  
**at least two vancomycin molecules coupled to the fullerene molecule,  
wherein at least two of the at least two vancomycin molecules are  
coupled to the fullerene molecule via the at least one linking molecule.**

*See supra* (Emphasis added). Amended claim 1 is illustrative of amended claims 23 and 37. As shown above, claim 1 recites the limitation of at least two *vancomycin molecules coupled to the fullerene molecule, wherein at least two of the at least two vancomycin molecules are coupled to the fullerene molecule via the at least one linking molecule.*

The Office Action asserts:

The attachment of the antibiotics of Yan et al. to the fullerenes of Bolskar et al may obviously be via a cyclopropane ring containing the functional groups (i.e., -COOR<sub>3</sub>, serinol, etc) and thus would be coupled to the fullerene via a single linking molecule.

See Office Action at 6. Applicants disclose a fullerene conjugate having multiple vancomycin moieties conjugated via a single linking molecule in Figure 2D and paragraph [0011] of the instant application. Neither *Bolskar* nor *Yan* disclose a fullerene conjugate having the Applicants' claimed coupling of at least two vancomycin molecules via the at least one linking molecule. Further, the Office Action has assumed that one of ordinary skill in the art when presented with a linker agent capable of functionalization at multiple sites would necessarily functionalize all the sites. Neither the Office Action nor the cited references provide support for such an assumption.

Further, the Office Action notes that *Bolskar* fails to teach antibiotic molecules coupled to the fullerene molecule, but asserts that *Yan* discloses attachment of an antibiotic to a functionalized substrate. The Office Action continues:

In regards to the antibiotic type, such as vancomycin, it is obvious to those skilled in the art to make known substitutions on compounds that are similar in structure and function to observe the effects on the function of such compounds and to use the observations/data to further manipulate a compound to generate the desired effect.

See Office Action at 4. Without admitting the propriety of the Office Action's combination of *Bolskar* and *Yan*, the Office Action is mistaken in suggesting that the disclosure of the broad genus of "antibiotics" by *Yan* renders obvious every species of antibiotic.

As explained by the Federal Circuit, **the fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness.** *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994). See MPEP 2144.08(II). The Office Action seems to suggest that it would be obvious to one of skill in the art to substitute vancomycin for any other antibiotic. In so-suggesting, the Office Action ignores that the chemical and biological arts are commonly recognized as inherently unpredictable and the fact that various antibiotics comprise vastly differing structures and functions. Thus, Applicants respectfully submit that the prior art's disclosure of antibiotics does not establish a *prima facie* case of obviousness as to vancomycin. As such, Applicants respectfully request withdrawal of the current rejections and allowance of the pending claims.

## CONCLUSION

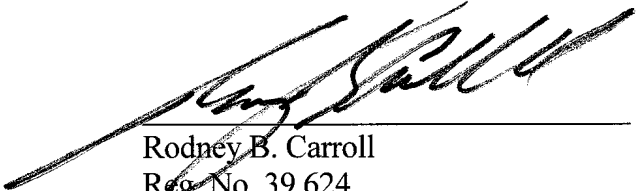
Consideration of the foregoing amendments and remarks, reconsideration of the application, and withdrawal of the rejections are respectfully requested by Applicants. No new matter is introduced by way of the amendment. It is believed that each ground of rejection raised in the Final Office Action dated December 5, 2008 has been fully addressed. If any fee is due as a result of the filing of this paper, please appropriately charge such fee to Deposit Account Number 50-1515 of Conley Rose, P.C., Texas. If a petition for extension of time is necessary in order for this paper to be deemed timely filed, please consider this a petition therefore.

If a telephone conference would facilitate the resolution of any issue or expedite the prosecution of the application, the Examiner is invited to telephone the undersigned at the telephone number given below.

Respectfully submitted,  
CONLEY ROSE, P.C.

Date: \_\_\_\_\_

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